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U.S. DEPARTMENT OF COMMERCE PATENT AND TRADEMARK OFFICE

ATTORNEY'S DOCKET NUMBER

**TRANSMITTAL LETTER TO THE UNITED STATES
DESIGNATED/ELECTED OFFICE (DO/EO/US)
CONCERNING A FILING UNDER 35 U.S.C. 371**

3286-0171P

U.S. APPLICATION NO. (if known, see 37 CFR 1.5)

094936047

INTERNATIONAL APPLICATION NO.

INTERNATIONAL FILING DATE

PRIORITY DATE CLAIMED

PCT/DE00/00737

March 9, 2000

March 9, 1999

TITLE OF INVENTION

*AUTOMATION SYSTEM WITH AUTOMATION OBJECTS WITH A DIRECTORY STRUCTURE AND METHOD FOR THE
MANAGEMENT OF AUTOMATIONS OBJECTS IN A DIRECTORY STRUCTURE

APPLICANT(S) FOR DO/EO/US

-BECKER, Norbert; DIEZEL, Matthias; ECKARDT, Dieter; KRAEMER, Manfred; LEINS, Ralf;
MOELLER-NEHRING, Walter; SCHNEIDER, Karsten; WINDL, Helmut, *

Applicant herewith submits to the United States Designated/Elected Office (DO/EO/US) the following items and other information:

1. ☒ This is a **FIRST** submission of items concerning a filing under 35 U.S.C. 371.
2. ☐ This is a **SECOND** or **SUBSEQUENT** submission of items concerning a filing under 35 U.S.C. 371.
3. ☒ This express request to begin national examination procedures (35 U.S.C. 371(f)) at any time rather than delay examination until the expiration of the applicable time limit set in 35 U.S.C. 371(b) and PCT Articles 22 and 39 (1).
4. ☒ The US has been elected by the expiration of 19 months from the priority date (Article 31).
5. ☒ A copy of the International Application as filed (35 U.S.C. 371(c)(2))
 - a. ☒ is transmitted herewith (required only if not transmitted by the International Bureau). WO 00/54147
 - b. ☒ has been transmitted by the International Bureau.
 - c. ☐ is not required, as the application was filed in the United States Receiving Office (RO/US).
6. ☒ An English language translation of the International Application as filed (35 U.S.C. 371(c)(2)).
 - a. ☒ is transmitted herewith.
 - b. ☐ has been previously submitted under 35 U.S.C. 154(d)(4)
7. ☒ Amendments to the claims of the International Application under PCT Article 19 (35 U.S.C. 371(c)(3)).
 - a. ☐ are transmitted herewith (required only if not transmitted by the International Bureau).
 - b. ☐ have been transmitted by the International Bureau.
 - c. ☐ have not been made; however, the time limit for making such amendments has NOT expired.
 - d. ☒ have not been made and will not be made.
8. ☐ An English language translation of the amendments to the claims under PCT Article 19 (35 U.S.C. 371(c)(3)).
9. ☐ An oath or declaration of the inventor(s) (35 U.S.C. 371(c)(4)).
10. ☒ An English language translation of the annexes of the International Preliminary Examination Report under PCT Article 36 (35 U.S.C. 371(c)(5)).

Items 11. to 20. below concern document(s) or information included:

11. ☒ An Information Disclosure Statement under 37 CFR 1.97 and 1.98-1449 and International Search Report (PCT/ISA/210) w/ 3 documents
12. ☐ An assignment document for recording. A separate cover sheet in compliance with 37 CFR 3.28 and 3.31 is included.
13. ☒ A FIRST preliminary amendment.
14. ☐ A SECOND or SUBSEQUENT preliminary amendment.
15. ☒ A substitute specification.
16. ☐ A change of power of attorney and/or address letter.
17. ☐ A computer-readable form of the sequence listing in accordance with PCT Rule 13ter.2 and 35 U.S.C. 1.821-1.825.
18. ☐ A second copy of the published international application under 35 U.S.C. 154(d)(4).
19. ☐ A second copy of the English language translation of the international application under 35 U.S.C. 154(d)(4).
20. ☒ Other items or information:
 - 1.) PCT Substitute Claims Letter w/ amendments
 - 2.) Two (2) sheets of Formal Drawings

*BIEHLER, Georg; DONNER, Albrecht; HERBERTH, Harald, LANGKAFEL, Dirk; LANGE, Ronald; SCHMOLL, Juergen; WELZ, Ulrich

JC12 Rec'd PCT/PTO 07 SEP 2001

U.S. APPLICATION NO. (if known, use 37 CFR 1.5) <div style="font-size: 1.5em; font-weight: bold; margin-top: 5px;">09/936047</div>		INTERNATIONAL APPLICATION NO. PCT/DE00/00737		ATTORNEY'S DOCKET NUMBER 3286-0171P																	
21. <input checked="" type="checkbox"/> The following fees are submitted: BASIC NATIONAL FEE (37 CFR 1.492(a)(1)-(5)): Neither international preliminary examination fee (37 CFR 1.482) nor international search fee (37 CFR 1.445(a)(2)) paid to USPTO and International Search Report not prepared by the EPO or JPO. \$1,000.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but International Search Report prepared by the EPO or JPO. \$860.00 International preliminary examination fee (37 CFR 1.482) not paid to USPTO but international search fee (37 CFR 1.445(a)(2)) paid to USPTO. \$710.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO but all claims did not satisfy provisions of PCT Article 33(1)-(4) \$690.00 International preliminary examination fee (37 CFR 1.482) paid to USPTO and all claims satisfied provisions of PCT Article 33(1)-(4) \$100.00 ENTER APPROPRIATE BASIC FEE AMOUNT =				CALCULATIONS PTO USE ONLY																	
Surcharge of \$130.00 for furnishing the oath or declaration later than <input type="checkbox"/> 20 <input checked="" type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(e)).				\$	860.00																
<table border="1" style="width:100%; border-collapse: collapse;"> <thead> <tr> <th style="width:20%;">CLAIMS</th> <th style="width:20%;">NUMBER FILED</th> <th style="width:20%;">NUMBER EXTRA</th> <th style="width:20%;">RATE</th> </tr> </thead> <tbody> <tr> <td>Total Claims</td> <td>8 - 20 =</td> <td>0</td> <td>X \$18.00</td> </tr> <tr> <td>Independent Claims</td> <td>1 - 3 =</td> <td>0</td> <td>X \$80.00</td> </tr> <tr> <td colspan="3">MULTIPLE DEPENDENT CLAIM(S) (if applicable) None</td> <td>+ \$270.00</td> </tr> </tbody> </table>				CLAIMS	NUMBER FILED	NUMBER EXTRA	RATE	Total Claims	8 - 20 =	0	X \$18.00	Independent Claims	1 - 3 =	0	X \$80.00	MULTIPLE DEPENDENT CLAIM(S) (if applicable) None			+ \$270.00	\$	130.00
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Total Claims	8 - 20 =	0	X \$18.00																		
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TOTAL OF ABOVE CALCULATIONS =				\$	990.00																
<input type="checkbox"/> Applicant claims small entity status. See 37 CFR 1.27. The fees indicated above are reduced by 1/2.				\$	0																
SUBTOTAL =				\$	990.00																
Processing fee of \$130.00 for furnishing the English translation later than <input type="checkbox"/> 20 <input type="checkbox"/> 30 months from the earliest claimed priority date (37 CFR 1.492(f)).				\$	0																
TOTAL NATIONAL FEE =				\$	990.00																
Fee for recording the enclosed assignment (37 CFR 1.21(h)). The assignment must be accompanied by an appropriate cover sheet (37 CFR 3.28, 3.31). \$40.00 per property +				\$	0																
TOTAL FEES ENCLOSED =				\$	990.00																
<div style="border: 1px solid black; height: 20px; width: 100%;"></div>				Amount to be:	\$																
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a. ☒ A check in the amount of \$ 990.00 to cover the above fees is enclosed.

b. ☐ Please charge my Deposit Account. No. _____ in the amount of \$ _____ to cover the above fees.
 A duplicate copy of this sheet is enclosed.

c. ☒ The Commissioner is hereby authorized to charge any additional fees which may be required, or credit any overpayment to Deposit Account No. 02-2448.

NOTE: Where an appropriate time limit under 37 CFR 1.494 or 1.495 has not been met, a petition to revive (37 CFR 1.137(a) or (b)) must be filed and granted to restore the application to pending status.

Send all correspondence to:
 Birch, Stewart, Kolasch & Birch, LLP or Customer No. 2292
 P.O. Box 747
 Falls Church, VA 22040-0747
 (703)205-8000

Date: September 7, 2001

By Donald J. Daley
 Donald J. Daley, #34,313

09936047-123302
09/936047
JC12 Rec'd PCT/PTO 07 SEP 2001

PATENT
3286-0171P

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicants: BECKER, Norbert et al.

Application No.: NEW

Filed: September 7, 2001

For: AUTOMATION SYSTEM WITH AUTOMATION OBJECTS WITH A
DIRECTORY STRUCTURE AND METHOD FOR THE
MANAGEMENT OF AUTOMATION OBJECTS IN A DIRECTORY
STRUCTURE

PRELIMINARY AMENDMENT

Assistant Commissioner for Patents
Washington, DC 20231

September 7, 2001

Sir:

The following preliminary amendments and remarks are respectfully submitted in connection with the above-identified application.

IN THE ABSTRACT

Please replace the Abstract with the attached revised Abstract.

IN THE SPECIFICATION

Please replace the original specification with the Substitute Specification attached hereto.

New U.S. Application
Docket No.: 3286-0171P

IN THE CLAIMS

Please replace the original claims with the following new claims:

1. (Amended) An automation system comprising:

at least one automation object;

a directory for storing object names of the at least one automation object;

an object name assigned to a directory entry which includes first information data as a reference to the at least one automation object, second information data as a description of technological functionality and third information data as a description of interfaces of the at least one automation object, wherein once entry into the directory has taken place, the at least one automation object can be viewed by at least one of other users and tools and wherein the object name of the at least one automation object can be used to request a reference to the at least one automation object and wherein the at least one automation object can be worked on by a number of users in parallel.

2. (Amended) The automation system as claimed in claim 1, wherein the directory entry includes fourth information data for listing the names of subcomponents of the at least one automation object.

3. (Amended) The automation system as claimed in claim 1, wherein the automation system includes means for the automatic entry of an automation object into the directory.

New U.S. Application
Docket No.: 3286-0171P

4. (Amended) The automation system as claimed in claim 1, wherein the automation system includes means for indicating that an automation object is no longer available and that a copy of the object is being created.

Please add the following new claims:

-- 5. The automation system as claimed in claim 2, wherein the automation system includes means for the automatic entry of an automation object into the directory.

6. The automation system as claimed in claim 2, wherein the automation system includes means for indicating that an automation object is no longer available and that a copy of the object is being created.

7. The automation system as claimed in claim 3, wherein the automation system includes means for indicating that an automation object is no longer available and that a copy of the object is being created.

8. The automation system as claimed in claim 5, wherein the automation system includes means for indicating that an automation object is no longer available and that a copy of the object is being created. --

REMARKS

Claims 1-8 are now present in this application, with new claims 5-8 being added by the present Preliminary Amendment. It should be noted that the amendments to original claims 1-4 of the present application are non-narrowing amendments, made solely to place the claims in proper form for U.S. practice and not to overcome any prior art or for any other statutory

New U.S. Application
Docket No.: 3286-0171P

considerations. For example, amendments have been made to broaden the claims; to remove reference numerals in the claims; remove the European phrase "characterized in that"; remove multiple dependencies in the claims; and to place claims in a more recognizable U.S. form, including the use of the transitional phrase "comprising" as well as the phrase "wherein". Other such non-narrowing amendments include adding the phrase --at least one of-- for consistency, and placing apparatus claims (elements set forth in separate paragraphs) in a more recognizable U.S. form. Again, all amendments are non-narrowing and have been made solely to place the claims in proper form for U.S. practice and not to overcome any prior art or for any other statutory considerations.

SUBSTITUTE SPECIFICATION

In accordance with 37 C.F.R. §1.125, a substitute specification has been included in lieu of substitute paragraphs in connection with the present Preliminary Amendment. The substitute specification is submitted in clean form, attached hereto, and is accompanied by a marked-up version showing the changes made to the original specification. The changes have been made in an effort to place the specification in better form for U.S. practice. No new matter has been added by these changes to the specification. Further, the substitute specification includes paragraph numbers to facilitate amendment practice as requested by the U.S. Patent and Trademark Office.

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CONCLUSION

Accordingly, in view of the above amendments and remarks, an early indication of the allowability of each of claims 1-8 in connection with the present application is earnestly solicited.

Should there be any outstanding matters that need to be resolved in the present application, the Examiner is respectfully requested to contact Donald J. Daley at the telephone number of the undersigned below.

If necessary, the Commissioner is hereby authorized in this, concurrent, and future replies, to charge payment or credit any overpayment to Deposit Account No. 02-2448 for any additional fees required under 37 C.F.R. § 1.16 or under 37 C.F.R. § 1.17; particularly, extension of time fees.

Respectfully submitted,

BIRCH, STEWART, KOLASCH & BIRCH, LLP

By: 

Donald J. Daley, Reg. No. 34,373

DJD:kna

P.O. Box 747
Falls Church, VA 22040-0747
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New U.S. Application
Docket No.: 3286-0171P

ABSTRACT

An automation system includes at least one automation object, with a directory for storing object names of the at least one automation object. An object name is assigned a directory entry which includes first information data as a reference to the automation object; second information data as a description of technological functionality; and third information data as a description of interfaces of the automation object. This results in immediate and permanent access to currently created (partial) solutions, so that parallel and/or distributed working on automation objects is possible.

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DESCPAMD

MARKED - UP VERSION OF SPECIFICATIONDescription

Automation system with automation objects with a directory structure and method for the management of automation objects in a directory structure

FIELD OF THE INVENTION
The invention relates to an automation system which has at least one automation object.

BACKGROUND OF THE INVENTION
An automation system of this type is used in particular in the area of automation technology. An automation system of this type generally ^{includes} comprises a multiplicity of individual automation objects, which are frequently highly dependent on the automation object of the engineering system respectively used. This has the consequence that automation objects of one manufacturer often require their own engineering system and cannot be used in other systems with automation objects of other manufacturers.

Robert Orfali et al: "The Essential Distributed Objects Survival Guide", 1996, John Wiley & Sons Inc., New York, USA, XP002152444, discloses the standardized middleware CORBA, which allows location-, platform- and implementation-independent communication between applications. The CORBA Version 2.0 makes it possible for messages be exchanged between Object Request Brokers (ORB) of various manufacturers and in particular also over the Internet. An ORB makes it possible for a client to send a message transparently to a server object, the server object being able to run on the same machine or another machine. The ORB is responsible for finding the server object, calling up the function there, transferring the parameters and returning the result to the client.

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DESCPAMD

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Summary of the invention - 1a -

The invention is based on the object of specifying an automation system which makes it possible for automation solutions to be created on a parallel and/or distributed basis.

This and/or other objects are

~~This object is~~ achieved by an automation system with the features specified in claim 1.

The invention is based on the realization that in previous solutions, the data of the automation solution ~~are~~ ^{are} generally stored in a central data store such as a database

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system. The data storage system then ^{Controlled} ~~controls~~ the access of various users to the data. In this case, it ^{users} ~~is~~ ensured that each user only ^{then} ~~sees~~ consistent data and ^{is} ~~is~~ isolated from changes made by other users. This generally ^{have} ~~takes~~ place by a user being granted exclusive access to his required data. In this time, these data ^{were} ~~are~~ not available to other users ^{had} ~~for~~ working on them. Therefore, this solution ^{has} ~~has~~ the following disadvantages:

- 10 • **No parallel working:** users ^{could} ~~can~~ only work on the same data records one after the other.
- **Slow exchange of partial results:** results only ^{became} ~~become~~ usable for other users when the data ^{had} ~~have~~ been released again by the last person working on them.
- 15 • **No joint working:** a number of users ^{would not} ~~cannot~~ work on the same objects together and exchange interim results.

The solution according to the invention permits immediate and permanent access to currently created partial solutions by the special way in which the directory is structured as a directory service. The directory service provides all developers with access to the current partial solutions and automation objects. This results in the following advantages:

- 20 • **Parallel working:** users can work on the same data records, required for different tasks (for example interconnection and parameterization), on a parallel basis.
- 30 • **Immediate availability of partial results:** results become usable for other users more quickly, not only when the data are released again by the last person working on them.
- **Joint working:** a number of users can work on the same objects together and exchange interim results.
- 35 • **Distributed working:** users can work on a (spatially) distributed basis; by means of the directory, they can, if need be, always re-synchronize the stages

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- 2a -

they have reached in working.

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*BRIEF DESCRIPTION OF THE DRAWINGS*³

The invention is described in more detail and explained below on the basis of the exemplary embodiments represented in the figures, in which:

- 5 figure 1 shows a basic representation of how a directory is structured and its entries and
figure 2 shows a schematic representation of the use of the directory entries.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

- 10 Figure 1 shows a basic representation of how a directory is structured and its entries. The automation system has a directory V, in which object names O1..On of automation objects can be stored. Each object name O1..On is assigned a directory entry, which contains
15 first information data O11 for an object reference, second information data O12 as a list of the modules contained in the automation object, third information data (O13) for the identification of interface data and fourth information data (O14) with names of
20 subcomponents.

- With the aid of the directory structure shown in figure 1, references to created (partial) solutions and/or automation objects are stored with descriptive data.
25 As in a telephone book, the name of the object can be used to find its reference (i.e. its telephone number).

- Along with a reference to the actual object, the entry ^{includes} comprises a description of its technological
30 functionality through the list of names of the modules contained, a listing of the names of any subcomponents and a description of its interface, which makes it possible for other objects/tools to use the objects referenced in this way.

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^{illustrates}
Figure 2, a schematic representation of the use of the directory entries. After the creation of an object, it is entered at certain points in time in the directory as entry OE1 for a first automation object. It can then be viewed by other users/tools. They can then use the name to request a reference to the object and work on or copy the latter directly.

Entering or changing or removing an object entry in the directory does not have to take place instantaneously. Here, too, the analogy with a telephone book again applies: even if individual entries become invalid, as a whole it can still be used. This property is important in particular in the case of distributed working, since the communication expenditure is minimized in this way. If an object is still in the directory, but no longer available, this is indicated when it is attempted to request a copy.

To sum up, the invention consequently relates to an automation system which has at least one automation object 1, with a directory V for storing object names O1..On of the automation objects, an object name O1..On being assigned a directory entry Oe1..Oen which has first information data O11 as a reference to the automation object, second information data O12 as a description of the technological functionality and third information data O13 as a description of interfaces of the automation object. This results in immediate and permanent access to currently created (partial) solutions, so that parallel and/or distributed working on automation objects is possible.

VARIATIONS →
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MARKED-UP CLAIMS

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CLMSPAMD

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Patent claims

1. ^(Amended) An automation system ^{comprising} which has ^{at least one} at least one automation object ^{object} with a directory ^{directory} [(V)] for storing object names [(O1..On)] of the automation objects, an object name [(O1..On)] being ^{assigned} assigned a directory entry [(OE1..Oen)] which ^{includes} includes first information data [(O11)] as a reference to the automation object, second information data [(O12)] as a description of the technological functionality and third information data [(O13)] as a description of interfaces of the automation object, [it being possible] ^{wherein} once entry into the directory [(V)] has taken place, ^{at least one} for the automation object ^{can} to be viewed by other users and/or tools and [it being possible to use] ^{wherein} the object name [(O1..On)] of the automation object ^{can be used} to request a reference to the automation object and the automation object ^{can} to be worked on by a number of users in parallel.
2. ^(Amended) The automation system as claimed in claim 1, ^{wherein} characterized in that the directory entry [(OE1)] has ^{includes} fourth information data [(O14)] for listing the names of subcomponents of the automation object.
3. ^(Amended) The automation system as claimed in ^{either of} either of claims ^{1 and 2} 1 and 2, ^{characterized in that} characterized in that the automation system ^{includes} has means for the automatic entry of an automation object into the directory [(V)].
4. ^(Amended) The automation system as claimed in ^{one of claims 1 to 3} one of claims 1 to 3, ^{characterized in that} characterized in that the automation system ^{includes} has means ^{for indicating} which indicate that an automation object is no longer available and that a copy of the object is being created.

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Printed: 04-30-2001 AMENDED SHEET

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5. Same as 3, but dep on 2
6. Same as 4, but dep on 2
7. Same as 4 but dep on 3
8. Same as 4 but dep on 5

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MARKED - IF ABSTRACT

Abstract

Automation system with automation objects with a directory structure and method for the management of automation objects in a directory structure

The invention relates to ^{an} ~~an~~ automation system which has at least one automation object ~~(1)~~, with a directory ^{includes} ~~(V)~~ for storing object names ~~(O1...On)~~ of the ^{at least one} automation objects. ^{ed least one} ~~An~~ object name ~~(O1...On)~~ ^{is} being assigned a directory entry ~~(OEl...Oen)~~ which ^{includes} has first information data ~~(O11)~~ as a reference to the automation object, second information data ~~(O12)~~ as a description of the technological functionality, and third information data ~~(O13)~~ as a description of interfaces of the automation object. This results in immediate and permanent access to currently created (partial) solutions, so that parallel and/or distributed working on automation objects is possible.

Figure-1-

SUBSTITUTE SPECIFICATION

AUTOMATION SYSTEM WITH AUTOMATION OBJECTS WITH A DIRECTORY STRUCTURE AND METHOD FOR THE MANAGEMENT OF AUTOMATION OBJECTS IN A DIRECTORY STRUCTURE

[0001] This application is the national phase under 35 U.S.C. § 371 of PCT International Application No. PCT/DE00/00737 which has an International filing date of March 9, 2000, which designated the United States of America, the entire contents of which are hereby incorporated by reference.

Field of the Invention

[0002] The invention relates to an automation system which has at least one automation object.

Background of the Invention

[0003] An automation system of this type is used in particular in the area of automation technology. An automation system of this type generally includes a multiplicity of individual automation objects, which are frequently highly dependent on the automation object of the engineering system respectively used. This has the consequence that automation objects of one manufacturer often require their own engineering system and cannot be used in other systems with automation objects of other manufacturers.

[0004] Robert Orfali et al: "The Essential Distributed Objects Survival Guide", 1996, John Wiley & Sons Inc., New York, USA, XP002152444, discloses the standardized middleware CORBA, which allows location-, platform- and implementation-independent communication between applications. The CORBA Version 2.0 makes it possible for messages be exchanged between Object Request Brokers (ORB) of various manufacturers and in particular also over the Internet. An ORB makes it possible for a client to send a message transparently to a server object, the server object being able to run on the same machine or another machine. The ORB is responsible for finding the server object, calling up the function there, transferring the parameters and returning the result to the client.

SUMMARY OF THE INVENTION

[0005] The invention is based on the object of specifying an automation system which makes it possible for automation solutions to be created on a parallel and/or distributed basis.

[0006] This and/or other objects are achieved by an automation system with the features specified in claim 1.

[0007] The invention is based on the realization that in previous solutions, the data of the automation solution were generally stored in a central data store such as a database system. The data storage system then controlled the access of various users to the data. In this case, it was ensured that each user only saw consistent data and is isolated from changes made by other users. This generally took place by a user being granted exclusive access to his required data. In this time, these data were not available to other users for working on them. Therefore, this solution had the following disadvantages:

- **No parallel working:** users could only work on the same data records one after the other.
- **Slow exchange of partial results:** results only became usable for other users when the data had been released again by the last person working on them.
- **No joint working:** a number of users could not work on the same objects together and exchange interim results.

[0008] The solution according to the invention permits immediate and permanent access to currently created partial solutions by the special way in which the directory is structured as a directory service. The directory service provides all developers with access to the current partial solutions and automation objects. This results in the following advantages:

- **Parallel working:** users can work on the same data records, required for different tasks (for example interconnection and parameterization), on a parallel basis.
- **Immediate availability of partial results:** results become usable for other users more quickly, not only when the data are released again by the last person working on them.
- **Joint working:** a number of users can work on the same objects together and exchange interim results.
- **Distributed working:** users can work on a (spatially) distributed basis; by means of the directory, they can, if need be, always re-synchronize the stages they have reached in working.

BRIEF DESCRIPTION OF THE DRAWINGS

[0009] The invention is described in more detail and explained below on the basis of the exemplary embodiments represented in the figures, in which:

Figure 1 shows a basic representation of how a directory is structured and its entries and

Figure 2 shows a schematic representation of the use of the directory entries.

DETAILED DESCRIPTION OF THE PREFERRED EMBODIMENTS

[0010] Figure 1 shows a basic representation of how a directory is structured and its entries. The automation system has a directory V, in which object names O1..On of automation objects can be stored. Each object name O1..On is assigned a directory entry, which contains first information data O11 for an object reference, second information data O12 as a list of the modules contained in the automation object, third information data (O13) for the identification of interface data and fourth information data (O14) with names of subcomponents.

[0011] With the aid of the directory structure shown in figure 1, references to created (partial) solutions and/or automation objects are stored with descriptive data. As in a telephone book, the name of the object can be used to find its reference (i.e. its telephone number).

[0012] Along with a reference to the actual object, the entry includes a description of its technological functionality through the list of names of the modules contained, a listing of the names of any subcomponents and a description of its interface, which makes it possible for other objects/tools to use the objects referenced in this way.

[0013] Figure 2 illustrates a schematic representation of the use of the directory entries. After the creation of an object, it is entered at certain points in time in the directory as entry OE1 for a first automation object. It can then be viewed by other users/tools. They can then use the name to request a reference to the object and work on or copy the latter directly.

[0014] Entering or changing or removing an object entry in the directory does not have to take place instantaneously. Here, too, the analogy with a telephone book again applies: even if individual entries become invalid, as a whole it can still be used. This property is important in particular in the case of distributed working, since the communication expenditure is minimized in this way. If an object is still in the directory, but no longer available, this is indicated when it is attempted to request a copy.

[0015] To sum up, the invention consequently relates to an automation system which has at least one automation object 1, with a directory V for storing object names O1..On of the automation objects, an object name O1..On being assigned a directory entry Oe1..Oen which has first information data O11 as a reference to the automation object, second information data O12 as a description of the technological functionality and third information data O13 as a description of interfaces of the automation object. This results in immediate and permanent access to currently created (partial) solutions, so that parallel and/or distributed working on automation objects is possible.

New U.S. Application
Docket No. 3286-0171P

[0016] The invention being thus described, it will be obvious that the same may be varied in many ways. Such variations are not to be regarded as a departure from the spirit and scope of the invention, and all such modifications as would be obvious to one skilled in the art are intended to be included within the scope of the following claims.

09/936047

04-25-2001
1999P03132 WO
PCT/DE00/00737

PCT/DE00/00737

DESCPAMD

JC12 Rec'd PCT/PTO 07 SEP 2001

Description

Automation system with automation objects with a directory structure and method for the management of automation objects in a directory structure

The invention relates to an automation system which has at least one automation object.

An automation system of this type is used in particular in the area of automation technology. An automation system of this type generally comprises a multiplicity of individual automation objects, which are frequently highly dependent on the automation object of the engineering system respectively used. This has the consequence that automation objects of one manufacturer often require their own engineering system and cannot be used in other systems with automation objects of other manufacturers.

Robert Orfali et al: "The Essential Distributed Objects Survival Guide", 1996, John Wiley & Sons Inc., New York, USA, XP002152444, discloses the standardized middleware CORBA, which allows location-, platform- and implementation-independent communication between applications. The CORBA Version 2.0 makes it possible for messages be exchanged between Object Request Brokers (ORB) of various manufacturers and in particular also over the Internet. An ORB makes it possible for a client to send a message transparently to a server object, the server object being able to run on the same machine or another machine. The ORB is responsible for finding the server object, calling up the function there, transferring the parameters and returning the result to the client.

04-25-2001
1999P03132 WO
PCT/DE00/00737

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- 1a -

The invention is based on the object of specifying an automation system which makes it possible for automation solutions to be created on a parallel and/or distributed basis.

This object is achieved by an automation system with the features specified in claim 1.

The invention is based on the realization that in previous solutions the data of the automation solution are generally stored in a central data store such as a database

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system. The data storage system then controls the access of various users to the data. In this case, it is ensured that each user only sees consistent data and is isolated from changes made by other users. This generally takes place by a user being granted exclusive access to his required data. In this time, these data are not available to other users for working on them. Therefore, this solution has the following disadvantages:

- 10 • **No parallel working:** users can only work on the same data records one after the other.
- **Slow exchange of partial results:** results only become usable for other users when the data have been released again by the last person working on them.
- 15 • **No joint working:** a number of users cannot work on the same objects together and exchange interim results.

The solution according to the invention permits immediate and permanent access to currently created partial solutions by the special way in which the directory is structured as a directory service. The directory service provides all developers with access to the current partial solutions and automation objects. This results in the following advantages:

- 20 • **Parallel working:** users can work on the same data records, required for different tasks (for example interconnection and parameterization), on a parallel basis.
- 25 • **Immediate availability of partial results:** results become usable for other users more quickly, not only when the data are released again by the last person working on them.
- **Joint working:** a number of users can work on the same objects together and exchange interim results.
- 30 • **Distributed working:** users can work on a (spatially) distributed basis; by means of the directory, they can, if need be, always re-synchronize the stages
- 35

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- 2a -

they have reached in working.

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- 3 -

The invention is described in more detail and explained below on the basis of the exemplary embodiments represented in the figures, in which:

5 figure 1 shows a basic representation of how a directory is structured and its entries and figure 2 shows a schematic representation of the use of the directory entries.

10 Figure 1 shows a basic representation of how a directory is structured and its entries. The automation system has a directory V, in which object names O1..On of automation objects can be stored. Each object name O1..On is assigned a directory entry, which contains
15 first information data O11 for an object reference, second information data O12 as a list of the modules contained in the automation object, third information data (O13) for the identification of interface data and fourth information data (O14) with names of
20 subcomponents.

With the aid of the directory structure shown in figure 1, references to created (partial) solutions and/or automation objects are stored with descriptive data.
25 As in a telephone book, the name of the object can be used to find its reference (i.e. its telephone number).

Along with a reference to the actual object, the entry comprises a description of its technological
30 functionality through the list of names of the modules contained, a listing of the names of any subcomponents and a description of its interface, which makes it possible for other objects/tools to use the objects referenced in this way.

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Figure 2 a schematic representation of the use of the directory entries. After the creation of an object, it is entered at certain points in time in the directory as entry OE1 for a first automation object. It can then be viewed by other users/tools. They can then use the name to request a reference to the object and work on or copy the latter directly.

Entering or changing or removing an object entry in the directory does not have to take place instantaneously. Here, too, the analogy with a telephone book again applies: even if individual entries become invalid, as a whole it can still be used. This property is important in particular in the case of distributed working, since the communication expenditure is minimized in this way. If an object is still in the directory, but no longer available, this is indicated when it is attempted to request a copy.

To sum up, the invention consequently relates to an automation system which has at least one automation object 1, with a directory V for storing object names O1..On of the automation objects, an object name O1..On being assigned a directory entry Oe1..Oen which has first information data O11 as a reference to the automation object, second information data O12 as a description of the technological functionality and third information data O13 as a description of interfaces of the automation object. This results in immediate and permanent access to currently created (partial) solutions, so that parallel and/or distributed working on automation objects is possible.

04-25-2001
1999P03132 WO
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CLMSPAMD

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Patent claims

1. An automation system which has at least one automation object, with a directory (V) for storing object names (O1..On) of the automation objects, an object name (O1..On) being assigned a directory entry (OE1..Oen) which has first information data (O11) as a reference to the automation object, second information data (O12) as a description of the technological functionality and third information data (O13) as a description of interfaces of the automation object, it being possible, once entry into the directory (V) has taken place, for the automation object to be viewed by other users and/or tools and it being possible to use the object name (O1..On) of the automation object to request a reference to the automation object and the automation object to be worked on by a number of users in parallel.
2. The automation system as claimed in claim 1, characterized in that the directory entry (OE1) has fourth information data (O14) for listing the names of subcomponents of the automation object.
3. The automation system as claimed in either of claims 1 and 2, characterized in that the automation system has means for the automatic entry of an automation object into the directory (V).
4. The automation system as claimed in one of claims 1 to 3, characterized in that the automation system has means which indicate that an automation object is no longer available and that a copy of the object is being created.

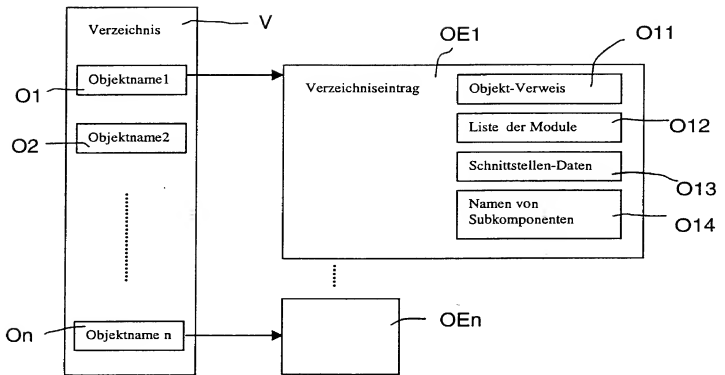
GR 99 P 3132

Abstract

Automation system with automation objects with a directory structure and method for the management of automation objects in a directory structure

The invention relates to an automation system which has at least one automation object (1), with a directory (V) for storing object names (O1..On) of the automation objects, an object name (O1..On) being assigned a directory entry (OE1..Oen) which has first information data (O11) as a reference to the automation object, second information data (O12) as a description of the technological functionality and third information data (O13) as a description of interfaces of the automation object. This results in immediate and permanent access to currently created (partial) solutions, so that parallel and/or distributed working on automation objects is possible.

Figure 1

**Fig. 1**

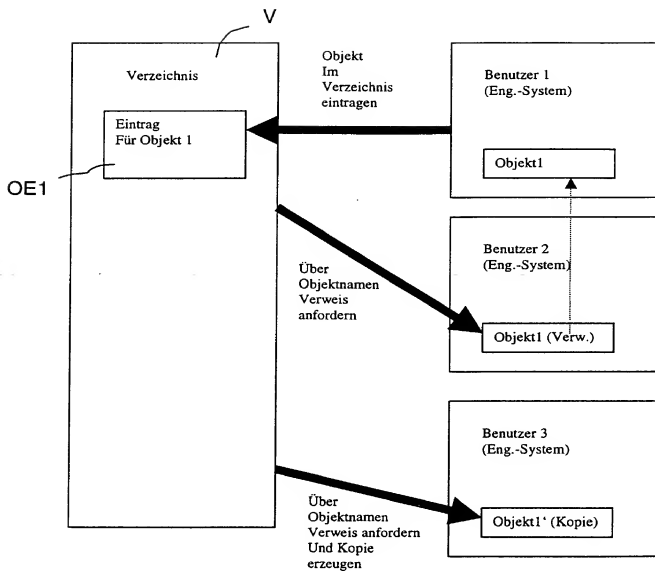


Fig. 2

Declaration and Power of Attorney For Patent Application

Erklärung Für Patentanmeldungen Mit Vollmacht

German Language Declaration

Als nachstehend benannter Erfinder erkläre ich hiermit an Eides Statt:

dass mein Wohnsitz, meine Postanschrift, und meine Staatsangehörigkeit den im Nachstehenden nach meinem Namen aufgeführten Angaben entsprechen,

dass ich, nach bestem Wissen der ursprüngliche, erste und alleinige Erfinder (falls nachstehend nur ein Name angegeben ist) oder ein ursprünglicher, erster und Miterfinder (falls nachstehend mehrere Namen aufgeführt sind) des Gegenstandes bin, für den dieser Antrag gestellt wird und für den ein Patent beantragt wird für die Erfindung mit dem Titel:

Automatisierungssystem mit
Automatisierungsobjekten mit
Verzeichnisstruktur und Verfahren zur
Verwaltung von
Automatisierungsobjekten in einer
Verzeichnisstruktur

deren Beschreibung

(zutreffendes ankreuzen)

☐ hier beigefügt ist.

☒ am 09.03.2000 als

PCT internationale Anmeldung

PCT Anmeldungsnummer PCT/DE00/00737

eingereicht wurde und am
abgeändert wurde (falls tatsächlich abgeändert).

Ich bestätige hiermit, dass ich den Inhalt der obigen Patentanmeldung einschliesslich der Ansprüche durchgesehen und verstanden habe, die eventuell durch einen Zusatzantrag wie oben erwähnt abgeändert wurde.

Ich erkenne meine Pflicht zur Offenbarung irgendwelcher Informationen, die für die Prüfung der vorliegenden Anmeldung in Einklang mit Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) von Wichtigkeit sind, an.

Ich beanspruche hiermit ausländische Prioritätsvorteile gemäss Abschnitt 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 119 aller unten angegebenen Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde, und habe auch alle Auslandsanmeldungen für ein Patent oder eine Erfindersurkunde nachstehend gekennzeichnet, die ein Anmeldedatum haben, das vor dem Anmeldedatum der Anmeldung liegt, für die Priorität beansprucht wird.

As a below named inventor, I hereby declare that:

My residence, post office address and citizenship are as stated below next to my name,

I believe I am the original, first and sole inventor (if only one name is listed below) or an original, first and joint inventor (if plural names are listed below) of the subject matter which is claimed and for which a patent is sought on the invention entitled

Automation system with automation
objects with a directory structure and
method for the management of
automation objects in a directory system

the specification of which

(check one)

☐ is attached hereto.

☒ was filed on 09.03.2000 as

PCT international application

PCT Application No. PCT/DE00/00737

and was amended on
(if applicable)

I hereby state that I have reviewed and understand the contents of the above identified specification, including the claims as amended by any amendment referred to above.

I acknowledge the duty to disclose information which is material to the examination of this application in accordance with Title 37, Code of Federal Regulations, §1.56(a).

I hereby claim foreign priority benefits under Title 35, United States Code, §119 of any foreign application(s) for patent or inventor's certificate listed below and have also identified below any foreign application for patent or inventor's certificate having a filing date before that of the application on which priority is claimed:

German Language Declaration

Prior foreign applications
Priorität beansprucht

Priority Claimed

19910537.5

DE

09.03.1999

☒

☐

(Number)
(Nummer)

(Country)
(Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

Yes
Ja

No
Nein

(Number)
(Nummer)

(Country)
(Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

☐
Yes
Ja

☐
No
Nein

(Number)
(Nummer)

(Country)
(Land)

(Day Month Year Filed)
(Tag Monat Jahr eingereicht)

☐
Yes
Ja

☐
No
Nein

Ich beanspruche hiermit gemäss Absatz 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 120, den Vorzug aller unten aufgeführten Anmeldungen und falls der Gegenstand aus jedem Anspruch dieser Anmeldung nicht in einer früheren amerikanischen Patentanmeldung laut dem ersten Paragraphen des Absatzes 35 der Zivilprozessordnung der Vereinigten Staaten, Paragraph 122 offenbart ist, erkenne ich gemäss Absatz 37, Bundesgesetzbuch, Paragraph 1.56(a) meine Pflicht zur Offenbarung von Informationen an, die zwischen dem Anmeldedatum der früheren Anmeldung und dem nationalen oder PCT internationalen Anmeldedatum dieser Anmeldung bekannt geworden sind.

I hereby claim the benefit under Title 35, United States Code, §120 of any United States application(s) listed below and, insofar as the subject matter of each of the claims of this application is not disclosed in the prior United States application in the manner provided by the first paragraph of Title 35, United States Code, §122, I acknowledge the duty to disclose material information as defined in Title 37, Code of Federal Regulations, §1.56(a) which occurred between the filing date of the prior application and the national or PCT international filing date of this application.

PCT/DE00/00737
(Application Serial No.)
(Anmeldeseriennummer)

09.03.2000
(Filing Date D, M, Y)
(Anmeldedatum T, M, J)

(Status)
(patentiert, anhängig,
aufgegeben)

pending
(Status)
(patented, pending,
abandoned)

(Application Serial No.)
(Anmeldeseriennummer)

(Filing Date D, M, Y)
(Anmeldedatum T, M, J)

(Status)
(patentiert, anhängig,
aufgeben)

(Status)
(patented, pending,
abandoned)

Ich erkläre hiermit, dass alle von mir in der vorliegenden Erklärung gemachten Angaben nach meinem besten Wissen und Gewissen der vollen Wahrheit entsprechen, und dass ich diese eidesstattliche Erklärung in Kenntnis dessen abgebe, dass wissenschaftlich und vorsätzlich falsche Angaben gemäss Paragraph 1001, Absatz 18 der Zivilprozessordnung der Vereinigten Staaten von Amerika mit Geldstrafe belegt und/oder Gefängnis bestraft werden können, und dass derartig wissenschaftlich und vorsätzlich falsche Angaben die Gültigkeit der vorliegenden Patentanmeldung oder eines darauf erteilten Patenten gefährden können.

I hereby declare that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true, and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code and that such willful false statements may jeopardize the validity of the application or any patent issued thereon.

German Language Declaration

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POWER OF ATTORNEY: As a named inventor, I hereby appoint the following attorney(s) and/or agent(s) to prosecute this application and transact all business in the Patent and Trademark Office connected therewith. (list name and registration number)

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5000

JC07 Rec'd PCT/PTO 13 FEB 2002

BOX PCT
PATENT
32860-000171/US

IN THE U.S. PATENT AND TRADEMARK OFFICE

Applicants: Norbert BECKER et al.

-Int'l Application No.: PCT/DE00/00737

Application No.: 09/936,047

Filed: September 7, 2001

For: AUTOMATION SYSTEM WITH AUTOMATION OBJECTS WITH
A DIRECTORY STRUCTURE AND METHOD FOR THE
MANAGEMENT OF AUTOMATION OBJECTS IN A DIRECTORY
STRUCTURECHANGE OF ADDRESS AND REVOCATION AND
SUBSTITUTION OF POWER OF ATTORNEYHon. Commissioner of Patents and Trademarks
Washington, D.C. 20231

January 2, 2002

Sir:

Under 37 C.F.R. § 3.73(b), the undersigned hereby states that the below-named Assignee is
an assignee in the above-identified Application:

Assignee: **SIEMENS AKTIENGESELLSCHAFT**

The documentary evidence of a chain of title from the original owner to the Assignee is
provided in the Assignment Document(s):

☒ filed herewith,☐ previously filed,

Reel No. _____, Frame No. _____.

I hereby declare that all statements made herein of my own knowledge are true, and that all
statements made on information and belief are believed to be true; and further that these statements
are made with the knowledge that willful false statements, and the like so made, are punishable by
fine or imprisonment, or both, under Section 1001, Title 18 of the United States Code, and that such
willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Application No. 09/936,047
Docket No. 32860-000171/US

POWER OF ATTORNEY

The Declaration submitted along with this application includes a Power of Attorney listing the attorneys of Birch, Stewart, Kolasch & Birch, LLP. Please hereby revoke the aforementioned attorneys and substitute the attorneys of Customer No. 30596, including the following attorneys of Harness, Dickey & Pierce, P.L.C., to prosecute this application and to transact all business in the Patent and Trademark Office connected therewith:

Terry L. Clark	Registration No. 32,644
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John A. Castellano	Registration No. 35,094
Gary D. Yacura	Registration No. 35,416
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CORRESPONDENCE ADDRESS

I request the Patent and Trademark Office to direct all correspondence and telephone calls relative to this application to Customer No. 30596, Harness, Dickey & Pierce, P.L.C., P.O. Box 8910, Reston, Virginia 20195, (703) 390-3030.

The undersigned is empowered with full Power of Attorney on behalf of the assignee.

Respectfully submitted,

HARNESS, DICKEY & PIERCE, P.L.C

By: 

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